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IWG/R-10

MAGNETIC RECORDERS AND/OR REPRODUCERS

I. INTRODUCTION

This paper was initiated pursuant to a request by a Department of Defense member of the Electronics Task Group that consideration be given to assignment of strategic ratings to certain types of magnetic recorders. No commodities in this category are at present under any form of U.S. or international control. It is desirable, in connection with consideration of strategic ratings, that all current, pertinent intelligence be assembled at this time.

II. DEFINITION AND DESCRIPTION

Magnetic wire and tape recorders are widely used for home, business, and entertainment purposes, are used extensively by radio broadcast stations, and have many other commercial applications. However, certain more advanced types of recorders have become an essential instrument of scientific investigation applied specifically to the development of modern military weapons. They also have important applications in the field of military communications.

For the purpose of this paper magnetic recorders will be discussed under two designations: (a) high-grade magnetic recorders; and (b) recorders of a less highly specialized character.

A. High-grade Magnetic Recorders

The more advanced types of magnetic recorders are those embodying any of the following characteristics:

1. Having a magnetic medium velocity greater than 15 inches per second. This refers to the speed at which the wire or tape travels, and determines the frequency of sound that can be recorded. The finest types of professional recorders, used for the high fidelity reproduction of music or voice, have tape speeds which do not exceed 15 inches per second. This permits reproduction of all sound within the audio range (from 50 to 15,000 cycles) with the maximum fidelity. Higher tape speeds would be superfluous for such use. This characteristic, therefore, applies to recorders capable of recording phenomena in the ultra-sonic range.

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2. Capable of recording and/or reproducing on two or more channels simultaneously. This characteristic of being able to record on several channels simultaneously is particularly useful in guided missile research. Experimental missiles carry many instruments which measure such items as speed, air pressure, temperature, inclination, yaw, and spin. When a missile is fired, there may be only a few seconds during which this information can be transmitted by radio and recorded by high-speed multi-channel recorders.

3. Employing a magnetic medium other than wire or tape (e.g. drum type). Drum-type recorders are used primarily in electronic computers (I/L 1565) as the memory element, or to store information for future use.

B. Magnetic Recorders of a Less Highly-Specialized Character

This designation covers recorders having tape or wire speeds not exceeding 15 inches per second, and normally includes only professional recorders of the type used as broadcast studio equipment. It does not include recorders used for home and business purposes, which normally have a peak speed not exceeding 7½ inches per second.

Within limits, magnetic recorders having speeds up to 15 inches per second could be used in the development of modern weapons of war. For example, a number of single-channel recorders could be effectively substituted for a multi-channel recorder, and speeds not exceeding 15 inches per second are adequate for many research and development purposes. Such recorders are finding increasing use in modern laboratories. Furthermore, such recorders are used by the military in the field for monitoring enemy radio traffic, and for psychological and deceptive warfare.

III. COMMON USE COMPONENTS

The principle components used in magnetic recorders such as described in A and B above are: (1) an amplifier; (2) magnetic tape or wire, recording head, and erasing head; and (3) the driving mechanism (synchronous motor). The tubes, condensors, resistors, and chokes used in the amplifiers are common-use items, as are the rectifier tubes or dry disk rectifiers used in the power supply unit of amplifiers.

IV. BLOC PRODUCTION OF MAGNETIC RECORDERS

A magnetic recorder is classified as electronic equipment because it incorporates tubes, condensers, resistors, capacitors, amplifiers, and other electronic components. Production of such instruments within the bloc is limited primarily by a critical shortage of capable electronic engineers and a general lack of technical know-how.

Available information indicates that bloc production of magnetic recorders is limited to a low-grade type which operates at a speed of 4.7 centimeters (about 2 inches) per second. Such recorders are unsuitable for the strategic applications which have been discussed, and are even unsatisfactory for normal reproduction of sound. A more advanced type of recorder, which would operate at 38 centimeters (about 15 inches) per second is reported to be under development in East Germany. While such a recorder would mark a great advance in Soviet bloc effort, it still would not reach the standards specified in this paper for a high-grade magnetic recorder.

V. SOVIET BLOC REQUIREMENTS

Currently and for some time to come the Soviet bloc must attempt to meet all its requirements for high-grade magnetic recorders as described in categories A and B above by imports from the Free World. It is not possible to estimate the quantity of such recorders which could be employed in the Soviet bloc research and development program. However, the essential nature of such recorders in modern research makes it certain that their lack or deficiency will seriously retard Soviet development of guided missiles, jet aircraft, and electronic computors.

VI. PROCUREMENT FROM THE FREE WORLD

At the present time recorders such as described in A above are made only on specific order by manufacturers in countries capable of producing them. None are produced for the general commercial market; therefore, none appears on domestic or international markets. Producing countries are the United States, the United Kingdom, France, and the Netherlands. There is no evidence that any Soviet bloc country has procured such a recorder from any of the producing countries.

Export statistics of European countries are not sufficiently detailed to reflect shipments of magnetic recorders of the type described in B above. However, these recorders appear on the domestic markets of the producing

countries and find their way into international trade. There is no specific information on the number of this type of recorder the bloc has procured from the West, but it is believed that some have found their way to Soviet destinations. A substantial number of wire and tape recorders are flowing into Red China. Some of these may fall under the category of the recorders described in B above.

Since 1948 the Soviet bloc has placed high priority on the procurement of magnetic recorders from Western sources of supply. In the past year the need for this type of electronic equipment in the USSR appears to have become more pressing. This is evidenced by the fact that the USSR has directed all the satellite countries to redouble their efforts to procure magnetic recorders of all types [redacted], and has placed the highest priority on their procurement. There is no information, however, that such procurement attempts have been successful. As stated above, the highest grade magnetic recorders have not as yet been produced for the general commercial market.